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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,938	02/08/2002	Yutaka Matsunobu	381AS/49196DV	8443

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EXAMINER

VANAMAN, FRANK BENNETT

ART UNIT	PAPER NUMBER
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3618

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/067,938

Applicant(s)

MATSUNOBU ET AL.

Examiner

Frank Vanaman

Art Unit

3618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5,7,9,13 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5,7,9,13 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Status of Application

1. Applicant's amendment, filed June 4, 2004, has been entered in the application. Claims 5, 7, 9, 13 and 17 are pending.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 5, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakatsu (US 4,335,429) in view of Tadahiro et al. (JP 8-33246) and Brown et al. (US 5,989,146). Kawakatsu teaches a hybrid electric vehicle having an engine (1) an electric motor (5, 7) connected in series to a drive shaft which is then connected to a differential for driving the vehicle wheels, the reference teaching no forward/reverse switching gear. The reference of Kawakatsu fails to teach the motor as being a permanent magnet machine having a stator, a stator core around which a coil is wound, a rotor arranged in the stator with a plurality of permanent magnets with the rotor being non-symmetrical at each pole, having a magnet accommodating slot which is inclined so as to be at a greater distance from the rotor circumference on a side associated with one rotational direction. Permanent magnet motors are extremely old and well known, and the provision of a stator with a core around which a coil is wound, wherein the stator surrounds a permanent magnet rotor is not at all beyond the skill of the ordinary practitioner, and it would have been obvious to one of ordinary skill in the art at the time of the invention to construct the motors of the vehicle of Kawakatsu with a permanent magnet motor having a stator around which a coil is wound, for the purpose of employing a well known and inexpensive standard motor for operating the vehicle. The modified reference of Kawakatsu fails to teach the rotor as including a non-symmetric configuration about a protruded pole, wherein a magnet insertion aperture is rectangular, and is inclined so as to favor a rotational direction. Tadahiro et al. teach a motor rotor having a plurality of permanent magnets (4a, 4b) which are installed in rectangular openings (3) which are inclined at an angle of between 10 and 45 degrees, the rotor including a plurality of protruded poles (e.g. A). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the non-symmetric

Art Unit: 3618

configuration of the magnet insertion openings as taught by Tadahiro et al. to a conventional permanent magnet motor structure usable in the vehicle of Kawakatsu, for the purpose of increasing the operational force which may be exerted by the motor in one rotational direction.

The modified reference to Kawakatsu teaches motor-only drive in the lowest speed ranges (figure 2), but fails to explicitly teach the provision of a rearward torque as being greater than a forward torque. Brown et al. teach that it is old and well known to provide a vehicle reverse gear with the lowest speed/highest torque relationship, generally a higher torque relationship than even the first forward gear (e.g., "first high" compared to "reverse high" gives 3.677:4.083, or 1.11), it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the motor such that a reverse drive direction of the motor would develop higher torque than a forward drive direction for the purpose of controlling the vehicle behavior to mirror a user's expectations based on commonly available vehicle with mechanical transmissions, such as taught by Brown et al.

4. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakatsu in view of Tadahiro et al. Brown et al. and Fumio (JP 9-271,151). The references of Kawakatsu, Tadahiro et al. and Brown et al. are discussed above, but fail to teach (a) the magnet and magnet insertion openings to be arc shaped and (b) the magnet and magnet insertion opening to have a width ratio of 1: 0.9-0.5. Fumio et al. teach a permanent magnet machine having a stator (20), a stator core (22) around which a coil (24) is wound, a rotor (32) arranged in the stator with a plurality of permanent magnets (36) with the rotor being non-symmetrical at each pole (figures 2, 5), having a magnet accommodating slot (34) of greater width than the magnet, the ratio of slot to magnet length being in the range of 1:0.5-0.9, the slot and magnet having a rectangular (fig. 5) or arc shaped (fig. 2) cross section. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the rotor magnet and insertion openings taught by Kawakatsu as modified by Tadahiro et al. and Brown et al. (a) to be arc shaped, for the purpose of adjusting the difference in motor output in the two running directions to be smaller or (b) such that the ratio of magnet width to

Art Unit: 3618

insertion opening width is in the range of 1:0.5-0.9 for the purpose of adjusting the difference in motor output in the two running directions to be greater.

Response to Comments

5. Applicant's comments, concerning the previously applied rejections under 35 USC 112, first paragraph, have been carefully considered. The rejections under 35 USC 112, first paragraph are withdrawn in view of applicant's comments. Applicant has stated that it may be possible for the reference to Tadahiro to support bi-directional rotation however (applicant's response, page 6, lines 13-16), and the examiner agrees. In that Tadahiro is not limited from supporting bi-directional rotation, and in that the provision of a reverse rotation gear having a higher torque lower speed range than a forward rotation direction, it is not considered to be beyond the skill of the ordinary practitioner to arrange the motor taught by Tadahiro to having the higher torque rotation operation be associated with reverse driving, in view of the specific teachings in Brown et al.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to F. Vanaman whose telephone number is 703-308-0424. Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist whose telephone number is 703-308-1113.

As of May 1, 2003, any response to this action should be mailed to:

Mail Stop _____
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450,

Or faxed to one of the following fax servers:

Regular Communications/Amendments: 703-872-9326
After Final Amendments: 703-872-9327
Customer Service Communications: 703-872-9325

F. VANAMAN
Primary Examiner
Art Unit 3618


9/16/04